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AUTHOR Kameoka, Velma; Tanaka-Matsumi, Junko
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ABSTRACT

The S-R Inventory of Anxiousness was developed as an experimental design to demonstrate the relative contributions of persons, situations, modes of response, and their interactions to individual differences in anxiety. College students in three studies were asked to rate a total of 154 items, involving 14 modes of response (physiological or overt behavioral indicators) and eleven anxiety-arousing experiences. Three major problems are discussed: (1) the apparent lack of distinction between "person" and "mode of response"; (2) influence of the non-random selection of "situations" and "mode of response" on the results of the analysis; and (3) problems in specifying and assessing the nature of person-situation interactions. While initial efforts to statistically demonstrate variance contribution of interactions deserve recognition, the variance components approach and previous application of the S-R Inventory do not lead to clarifying the specific nature of person-situation interactions in influencing anxiousness. Future research on person-situation interactions, therefore, identify specific person and situation characteristics and incorporate aspects of both these factors in a systematic research design. (Author/CP)

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The Appropriateness of Using the S-R Inventory of Anxiousness to Measure Sources of Behavioral Variability

Velma Kameoka and Junko Tanaka-Matsumi

University of Hawaii

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Abstract

The S-R Inventory of Anxiousness is critically examined for its appropriateness as an experimental design to demonstrate sources of behavioral variance. The purpose, development, use of the inventory, and the ensuing analysis are reviewed. Three major problems are discussed in light of the research questions. These problems include first, the apparent lack of distinction between "person" and "mode of response"; second, influence of the non-random selection of "situations" and "mode of response" on the results of the analysis; and third, problems in specifying and assessing the nature of person-situation interactions. While initial efforts to statistically demonstrate variance contribution of interactions deserve recognition, it is maintained that the variance components approach and previous application of the S-R Inventory of Anxiousness do not lead to clarifying the specific nature of person-situation interactions in influencing anxiousness. Rather, it is suggested that future research on person-situation interactions would benefit by identifying specific person and situation characteristics and incorporating aspects of both these factors in a systematic research design.

The Appropriateness of Using the S-R Inventory of Anxiousness to Measure Sources of Behavioral Variability

Whether the major sources of behavioral variance are accounted for by the situation or the person has been a topic of theoretical debate and empirical research (e.g., Argyle & Little, 1972; Bowers, 1972; Mischel, 1968, 1973; Ekehammar, 1974; Endler, 1975, 1977; Endler & Magnusson, 1976). This debate has led to extensive research on person-situation interactions as a substantive topic in its own right (Mischel, 1973; Endler & Magnusson, 1976). In an early and influential study, Endler, Hunt, and Rosenstein (1962) introduced and developed the self-report S-R Inventory of Anxiousness and used it as a "variance components research strategy" (Endler, 1966) to compare the relative sizes of the contributions to the total variance in behavior from individual differences (person), situations, and their interactions.

In light of continued use of the inventory and increased attention given to empirical assessment of person-situation interactions (Endler & Magnusson, 1976; Magnusson & Endler, 1977), the purpose of the present paper is to critically examine the appropriateness of using the S-R Inventory of Anxiousness as an experimental design to measure sources of behavioral variability.

The S-R Inventory of Anxiousness: Description and Analysis

Endler, et. al. (1962) developed the S-R Inventory of Anxiousness and used it as an experimental design to demonstrate the relative contributions of persons, situations, modes of response, and their interactions to subject variability in anxiety (Endler & Hunt, 1966, 1969). The original inventory consisted of 11 potentially anxiety arousing situations. According

to the investigators, these situations were selected on "intuitive" bases and for their relevance to anxiety-arousing experiences of college students. Following presentation of each situation, subjects were asked to rate themselves on a five-point rating scale on 14 anxiety response indicators which the investigators termed, "modes of response." Modes of response included both physiological and overt behavioral indicators of anxiousness and were selected to represent both positive and negative "drive." Items were also incorporated from the MMPI and the Taylor Manifest Anxiety Scale. Subjects were therefore asked to rate a total of 154 items: 14 modes of response X 11 situations. In short, the inventory was conceptualized as a three dimensional data matrix and used as an experimental design.

In the initial study, Endler, et. al. (1962) employed a three-way, fully crossed, random effect model with one observation per cell and computed mean squares for each of the three main factors (modes of response, situations, and persons) and three two-way interactions (modes of response X situations, modes of response X persons, situations X persons). The analysis indicated that in one sample the mean square for situations was 11 times greater than the mean squares for subjects. As a result of this analysis, the importance of situation in the assessment of anxiety was emphasized. However, in a subsequent analysis of the data (Endler & Hunt, 1966) which compared the relative contributions of each variance component, it was found that neither individual differences among subjects, situations, nor modes of response, per se, accounted for a larger portion of the total variance. Instead, the results demonstrated a sizable third of the total variance to be attributable to the simple interactions between the main sources. This result was substantiated by findings of a subsequent study (Endler & Hunt, 1969).

In sum, these investigators concluded that no single source can sufficiently explain behavioral variability in anxiety; rather, one must examine interactions of the major sources of variance.

Problems in Employing the S-R Inventory of Anxiousness as an Experimental Design

1. What does person represents in the analysis of the S-R Inventory of Anxiousness?

Endler, et. al. (1966) concluded that person (individual differences) accounts for relatively small proportions of total variation in anxiety responses. However, person conceived as an independent source of variance raises questions: that is, what does person meaningfully represent in the authors' data analytic strategy? In their design, subjects responded specifically to 11 specific situations through 14 modes of responses (Cartwright, 1975). Obviously, individual differences in anxiousness are reflected in individual variations of response patterns. The S-R Inventory was, in fact, designed to incorporate different modes of response such that subject differences in anxiety may be discerned. To the extent that these modes of response may be considered alternatively as multiple dependent measures (Ekehammar, 1974) for the measurement of anxiousness, subject differences in response patterns lead to a direct assessment of individual differences in anxiousness across situations sampled. Therefore, it is quite apparent that response mode constitutes a characteristic of the individual and that person and modes of response are indistinguishable. Rather, person is more aptly defined as "response generators" (Shine & Bower, 1971) as conceptualized in the ANOVA model for intrasubject designs (see Hersen & Barlow, 1976). If the inventory is to be applied an an experimental

design rather than as a test to measure the degree of a person's self-report of anxiousness, future efforts should be directed to clarifying the distinction between person and mode of response.

2. How does the selected model and the main factors influence the results of the analysis?

As previously noted, the original inventory sampled 11 situations and 14 modes of response. The item sampling from the respective populations of situations and response modes was not randomly determined (Endler, et. al., 1962). However, both of these factors were treated by the investigators as fully crossed and random. Their design, indeed, is more appropriately a mixed model with subjects random and situations and modes of response fixed. The authors argued that because the mixed-model assumes triple interaction to be zero and because such interaction in their study of anxiousness has "psychological meaning" (Endler, 1966) they opted for the random model. Although it is important to study triple interaction, it is an empirical question to be investigated rather than a question of a mathematical model. Endler stated that "the most practical solution when using the S-R Inventory is to have replications with different sample groups, and to use different forms of the inventory" (Endler, 1966, p. 568). Thus, the generalizability of each analysis may be limited.

Furthermore, the relative contribution of the main effects can be artificially inflated as a function of the range of items selected for inclusion in response modes and situations (Cartwright, 1975). Likewise, subject variables can influence the magnitude of variance attributable to situations and mode of response (Cartwright, 1975; Golding, 1975). As empirically demonstrated by Cartwright (1975), such influences will be

manifested in the coefficient of variance component which can be obtained by forming the product of n and the number of levels of the variables not included in the subscript of the variance component under consideration (Gaito, 1960). This issue is particularly critical because their research questions require the comparison of variance attributable to each source against the total variance. Given this design and selection procedure for the main factors, the genreralizability of the findings must be questioned.

3. Does use of the S-R Inventory of Anxiousness contribute to the specification of behavior in situations?

Endler and his colleagues used the S-R Inventory of Anxiousness to demonstrate the importance of assessing person, situation, and their interactions in accounting for anxiety responses. Indeed, the inventory has the advantage of asking specific responses of the subjects in specific situations. However, their data analysis does not lead to specification and assessment of how particular situations and persons interact to influence behavior.

Given the design employed in their research, the data merely provides information regarding the relative size of the variance attributable to each source. Despite the fact that the inventory examines subjects' specific modes of response to 11 situations, the variance components analysis does not provide information regarding differential responding across situations. As their design has single observations per cell, the triple interaction is confounded with error. Thus, if one is to obtain person-specific reponses in specific situations, the present design is not suitable. That is, to demonstrate variance contributions of main sources, each main factor is collapsed against each other. While the advantage of the inventory over previous anxiety scales lies in its ability to elicit a person's specific

responses in specific situations, the investigators' use of the scale needs reconsideration.

Summary and Conclusion

The S-R Inventory of Anxiousness was critically examined for its appropriateness as an experimental design to demonstrate sources of behavioral variance. The purpose, development, use of the inventory, and the ensuing analysis were reviewed. Three major problems were discussed in light of the research questions. The discussion concerned first, the apparent lack of distinction between person and mode of response; second, influence of the non-random selection of situations and mode of response on the results of the analysis; and third, problems in specifying and assessing the nature of person-situation interactions.

In sum, clearly, situation and person variables operate in complex interactions and as Cronbach (1975) has maintained, the study of human behavior must be a study of higher-order interactions. While initial efforts to statistically demonstrate variance contribution of interactions deserve recognition, the variance components approach and previous application of the S-R Inventory of Anxiousness do not lead to clarifying the specific nature of person-situation interactions in influencing anxiousness. Recently, numerous investigators (e.g., Endler, 1977; Golding, 1975) have recognized the need for systematic research which directly test variations of person and situation variables. However, only a very few studies (e.g., Mariotto & Paul, 1975) have accomplished this task. Future research on person-situation interactions would benefit by identifying specific person and situation characteristics and incorporating aspects of both these factors in a systematic research design.

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